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## INSPEC - 1969 to date (INZZ)

**Accession number & update**
    5992585, B9809-1265H-038; 980804.
**Title**
    **Encoding** hidden data channels in sigma-delta bitstreams.
**Author(s)**
    Magrath-A-J; Sandler-M-B.
**Author affiliation**
    Dept of Electr Eng, King's Coll, London, UK.
**Source**
    ISCAS '98. Proceedings of the 1998 IEEE International Symposium on Circuits and Systems, vol.1,
    Monterey, CA, USA, 31 May-3 June 1998.
    In: p.385-8 vol.1, 1998.
**ISSN**
    ISBN: 0-7803-4455-3, CCCC: 0 7803 4455 3/98/ ($10.00).
**Publication year**
    1998.
**Language**
    EN.
**Publication type**
    CPP Conference Paper.
**Treatment codes**
    T Theoretical or Mathematical.
**Abstract**
    A new technique is introduced which allows a hidden data channel to be **encoded** onto a sigma-delta
    bit-stream in **addition** to the primary signal **input.** The technique is developed so that the primary
    signal can be demodulated by standard techniques, without interference by the side-channel.
    Applications include imprinting a **watermark'** onto an archived audio recording, or **encoding**
    **additional** hidden audio or video channels in the bitstream. Results are presented which indicate that
    side-channel data rates in excess of 500 kbit/s are possible. (10 refs).
**Descriptors**
    channel-coding; sigma-delta-modulation.
**Keywords**
    hidden data channel **encoding;** sigma delta bitstream; signal demodulation; **watermark;** archived
    audio recording; audio channel; video channel; side channel data rate; 500 kbit s.
**Classification codes**
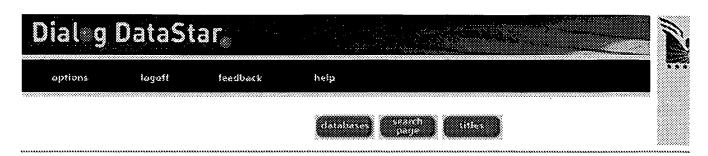    B1265H (A/D and D/A convertors).
    B6120B **(Codes).**

**Numerical indexing**
  bit rate: 5.0E+05 bit/s.
**Copyright statement**
  Copyright 1998, IEE.


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## INSPEC - 1969 to date (INZZ)

**Accession number & update**
> 6404796, B1999-12-6130C-013, C1999-12-6130M-030; 19991201.

**Title**
> Non-invertible watermarking methods for MPEG **encoded** audio.

**Author(s)**
> Lintain-Qiao; Nahrstedt-K.

**Author affiliation**
> Lucent Technol, AT&T Bell Labs, Naperville, IL, USA.

**Source**
> Security and Watermarking of Multimedia Contents, San Jose, CA, USA, 25-27 Jan. 1999.
> Sponsors: IS&T, SPIE.
> In: Proceedings-of-the-SPIE-The-International-Society-for-Optical-Engineering (USA), vol.3657,
> p.194-202, 1999.

**CODEN**
> PSISDG.

**ISSN**
> ISSN: 0277-786X, CCCC: 0277-786X/99/ ($10.00).

**Availability**
> SICI: 0277-786X(1999)3657L.194:IWMM; 1-H.

**Publication year**
> 1999.

**Language**
> EN.

**Publication type**
> CPP Conference Paper, J Journal Paper.

**Treatment codes**
> P Practical.

**Abstract**
> Nowadays the multimedia technology in distributed environments becomes realistic and the multimedia
> copyright protection issue becomes more and more important. Various digital watermarking techniques
> have been proposed in recent years as the methods to protect the copyright of multimedia data.
> Although, conceptually, these techniques can be easily extended for protecting digital audio data, it is
> challenging to **apply** these techniques to MPEG audio streams because we need to design the
> watermarking schemes working directly in the compressed data domain. We present watermarking
> methods which will **embed** the **watermark** directly into the MPEG audio bit streams rather than going
> through an expensive **decoding/encoding** process in order to **apply** watermarking schemes in the
> uncompressed data domain. Among the two presented schemes, one **embeds** the **watermark** into the

scale factors of the MPEG audio streams and **another** one **embeds** the **watermark** into the MPEG **encoded** samples. Our experimental results show that both methods perform well and the distortion could be controlled at the minimal level. While we use MPEG audio **layer** II streams in our experimental tests, the proposed schemes can be applied to MPEG audio **layer** I and III. Furthermore, by enforcing creation of the **watermark** through a standard encryption function such as DES, the proposed schemes will be successful in resolving rightful ownership of watermarked MPEG audio. (17 refs).

**Descriptors**
audio-coding; code-standards; copyright; cryptography; multimedia-systems; telecommunication-standards.

**Keywords**
noninvertible watermarking; MPEG **encoded** audio; multimedia; distributed environments; copyright; encryption; audio bit streams; decoding; **encoding;** scale factors; experiment.

**Classification codes**

| | |
|---|---|
| B6130C | (Speech and audiocoding). |
| B6120B | (Codes). |
| B6210R | (Multimedia communications). |
| C6130M | (Multimedia). |

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